



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-1657; Project Identifier AD-2022-01475-T; Amendment 39-22292; AD 2022-27-07]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain The Boeing Company Model 747-400 and 747-8 series airplanes. This AD was prompted by reports of wear-through of the motor impeller inlet adapter of a transfer pump for the horizontal stabilizer fuel tank caused by contact between the pump inlet check valve and the inlet adapter. This AD requires inspecting for wear of the motor impeller inlet check valves and inlet adapters of the transfer pumps for the horizontal stabilizer fuel tank and doing corrective actions, if necessary. This AD also limits the installation of affected parts. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The FAA must receive comments on this AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to [regulations.gov](https://www.regulations.gov). Follow the instructions for submitting comments.

- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) by searching for and locating Docket No. FAA-2022-1657; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The street address for Docket Operations is listed above.

Material Incorporated by Reference:

- For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.

- You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available at [regulations.gov](https://www.regulations.gov) by searching for and locating Docket No. FAA-2022-1657.

FOR FURTHER INFORMATION CONTACT: Samuel Dorsey, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone: 206-231-3415; email: Samuel.j.dorsey@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written data, views, or arguments about this final rule. Send your comments to an address listed under ADDRESSES. Include Docket No. FAA-2022-1657 and Project Identifier AD-2022-01475-T at the beginning of your comments. The most helpful comments reference a specific portion of the final rule, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this final rule because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this final rule.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this AD contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this AD, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public

docket of this AD. Submissions containing CBI should be sent to Samuel Dorsey, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone: 206-231-3415; email: Samuel.j.dorsey@faa.gov. Any commentary that the FAA receives that is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA has received reports indicating wear-through of the motor impeller inlet adapter of the horizontal stabilizer fuel tank transfer pumps (also referred to as a transfer/jettison pump or override/jettison pump). These reports were received following troubleshooting of fuel imbalance issues involving the main wing fuel tanks, which utilize the same pump design as the horizontal stabilizer fuel tank.

Boeing investigations have found two pumps with wear sufficient to allow contact between the motor impeller inlet check valve flapper and the pump inducer. An additional 22 worn pumps have been identified. Investigations have shown that oscillations within the fuel flow around the pumps can cause the inlet check valve to vibrate as it is held spring-loaded against the inlet adapter of the pump. Undetected or unmitigated wear could allow the flapper of the inlet check valve to contact the rotating motor inducer, creating steel-on-steel contact. There is a period of operation during each flight with a fueled horizontal stabilizer fuel tank where the pump will run dry for a short period before the flightcrew is alerted to shut it down, or the pump is automatically shut off. During this dry run period, if the wear on the inlet adapter is severe enough, the steel-on-steel contact can cause a source of heat and/or sparking within the fuel tank. This condition, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane. The FAA is issuing this AD to address the unsafe condition on these products.

FAA's Determination

The FAA is issuing this AD because the agency has determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Related Service Information under 1 CFR Part 51

The FAA reviewed Boeing Multiple Operator Message MOM-MOM-22-0549-01B(R1), dated November 29, 2022. This service information specifies procedures for one-time detailed visual inspections for wear (hinge pin protrusion, gouging, missing material, corrosion, burrs, and raised material) of the motor impeller inlet adapters and inlet check valves of the horizontal stabilizer fuel tank transfer pumps. This service information also specifies replacing certain inlet check valves and inlet adapters with serviceable parts and reporting inspection results to Boeing. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

AD Requirements

This AD requires accomplishing the actions specified in the service information already described. This AD also limits the installation of affected parts.

Interim Action

This AD is considered to be interim action. The inspection reports that are required by this AD will enable the manufacturer to obtain better insight into the nature, cause, and extent of the wear-through, and eventually to develop final action to address the unsafe condition. Further, the main and center wing tanks utilize the same pump design but are currently not subject to the same unsafe condition due to the shutoff logic of the transfer pumps. However, if that should change or once final action has been identified, the FAA might consider further rulemaking.

Justification for Immediate Adoption and Determination of the Effective Date

Section 553(b)(3)(B) of the Administrative Procedure Act (APA) (5 U.S.C. 551 *et seq.*) authorizes agencies to dispense with notice and comment procedures for rules when the agency, for “good cause,” finds that those procedures are “impracticable, unnecessary, or contrary to the public interest.” Under this section, an agency, upon finding good cause, may issue a final rule without providing notice and seeking comment prior to issuance. Further, section 553(d) of the APA authorizes agencies to make rules effective in less than thirty days, upon a finding of good cause.

An unsafe condition exists that requires the immediate adoption of this AD without providing an opportunity for public comments prior to adoption. The FAA has found that the risk to the flying public justifies forgoing notice and comment prior to adoption of this rule because wear-through of the motor impeller inlet adapter of a transfer pump for the horizontal stabilizer fuel tank may allow the pump’s inlet check valve to contact the rotating pump inducer. During the 15-second dry run period experienced every flight with a fueled horizontal stabilizer tank, the steel-on-steel contact can cause a source of heat and/or sparking (an ignition source) within the fuel tank. This contact in combination with flammable fuel vapors, if not addressed, could result in an explosion in the fuel tank and consequent loss of the airplane. Accordingly, notice and opportunity for prior public comment are impracticable and contrary to the public interest pursuant to 5 U.S.C. 553(b)(3)(B).

In addition, the FAA finds that good cause exists pursuant to 5 U.S.C. 553(d) for making this amendment effective in less than 30 days, for the same reasons the FAA found good cause to forgo notice and comment.

Regulatory Flexibility Act

The requirements of the Regulatory Flexibility Act (RFA) do not apply when an agency finds good cause pursuant to 5 U.S.C. 553 to adopt a rule without prior notice and

comment. Because the FAA has determined that it has good cause to adopt this rule without notice and comment, RFA analysis is not required.

Costs of Compliance

The FAA estimates that this AD affects 28 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

Estimated costs

| Action | Labor cost | Parts cost | Cost per product | Cost on U.S. operators |
|---|---|-------------------|-------------------------|-------------------------------|
| Inspections of motor impeller inlet adapter and inlet check valve (left and right transfer pumps) | 12 work-hours X \$85 per hour = \$1,020 | \$0 | \$1,020 | \$28,560 |
| Reporting | 1 work-hour X \$85 per hour = \$85 | \$0 | \$85 | \$2,380 |

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the inspection. The FAA has no way of determining the number of aircraft that might need these replacements:

On-condition costs

| Action | Labor cost | Parts cost | Cost per product |
|--|---|-------------------|-------------------------|
| Replace motor impeller inlet adapter | 4 work-hours X \$85 per hour = \$340 | \$1,000 | \$1,340 |
| Replace motor impeller inlet check valve | 17 work-hours X \$85 per hour = \$1,445 | \$20,000* | \$21,445 |

* Boeing has indicated that the motor impeller inlet check valve is not currently available as a standalone part; this cost is for the pump housing, which contains the motor impeller inlet check valve. Boeing has indicated that it is working with the part supplier to make the motor impeller inlet check valve available as a standalone part.

Paperwork Reduction Act

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act

unless that collection of information displays a currently valid OMB Control Number.

The OMB Control Number for this information collection is 2120-0056. Public reporting for this collection of information is estimated to be approximately 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866, and
- (2) Will not affect intrastate aviation in Alaska.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2022-27-07 The Boeing Company: Amendment 39-22292; Docket No. FAA-2022-1657; Project Identifier AD-2022-01475-T.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 747-400 and 747-8 series airplanes, certificated in any category, equipped with an activated horizontal stabilizer fuel tank.

(d) Subject

Air Transport Association (ATA) of America Code 28, Fuel.

(e) Unsafe Condition

This AD was prompted by reports of wear-through of the motor impeller inlet adapter of the horizontal stabilizer fuel tank transfer pump caused by contact between the motor impeller inlet check valve and the inlet adapter. The FAA is issuing this AD to address the development of an ignition source within the horizontal stabilizer fuel tank resulting from wear to the motor impeller inlet check valves and inlet adapters of the horizontal stabilizer fuel tank transfer pumps. This condition, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Definitions

(1) A “serviceable” inlet adapter is an inlet adapter of the motor impeller assembly for which any missing material does not exceed 0.20 inch in the pump axial direction.

(2) A “serviceable” inlet check valve is an inlet check valve for which the hinge pin protrudes past the flapper arm on both sides and there is no metal disk gouging, missing material, corrosion, burrs, or raised material. Minor surface scratches, defects, or appearances of surface wear are acceptable.

(3) A horizontal stabilizer tank is considered to be “activated” if it is not deactivated by an approved alteration.

(h) Inspection and Corrective Action: Inlet Check Valve

Within 90 days after the effective date of this AD: Do a detailed visual inspection of the inlet check valve in the left and right transfer pump housing for hinge pin protrusion, gouging, missing material, corrosion, burrs, and raised material, in accordance

with paragraph C., Work Instructions, Attachment A, Boeing Multiple Operator Message MOM-MOM-22-0549-01B(R1), dated November 29, 2022.

(1) Condition 1: If the hinge pin does not protrude past the flapper arm on one side, or if any gouging, missing material, corrosion, burrs, or raised material is found on the inlet check valve, do the actions required by paragraphs (h)(1)(i) and (ii) of this AD.

(i) Report inspection findings in accordance with paragraph (j) of this AD.

(ii) Prior to further flight, replace the inlet check valve or transfer pump housing with a serviceable inlet check valve or transfer pump housing containing a serviceable inlet check valve, in accordance with paragraph C., Work Instructions, Attachment A, Boeing Multiple Operator Message MOM-MOM-22-0549-01B(R1), dated November 29, 2022.

(2) Condition 2: If the hinge pin does protrude past the flapper arm on both sides, and no gouging, missing material, corrosion, burrs, or raised material is found, report inspection findings in accordance with paragraph (j) of this AD.

(i) Inspection and Corrective Action: Transfer Pump Motor Impeller Inlet Adapter

Within 90 days after the effective date of this AD: Do a detailed visual inspection of the transfer pump motor impeller inlet adapter for wear (missing material), in accordance with paragraph D., Work Instructions, Attachment A, Boeing Multiple Operator Message MOM-MOM-22-0549-01B(R1), dated November 29, 2022.

(1) Condition 1: If any wear is found that is 0.20 inch or less, report inspection findings in accordance with paragraph (j) of this AD.

(2) Condition 2: If any wear is found that is greater than 0.20 inch, do the actions required by paragraphs (i)(2)(i) and (ii) of this AD.

(i) Report inspection findings in accordance with paragraph (j) of this AD.

(ii) Before further flight, replace the transfer pump motor impeller with a transfer pump motor impeller having a serviceable inlet adapter, in accordance with paragraph D.,

Work Instructions, Attachment A, Boeing Multiple Operator Message

MOM-MOM-22-0549-01B(R1), dated November 29, 2022.

(j) Reporting Inspection Results

At the applicable time specified in paragraph (j)(1) or (2) of this AD, submit a report of all findings of the inspections required by paragraphs (h) and (i) of this AD, in accordance with paragraph G. and Appendix A, Attachment A, Boeing Multiple Operator Message MOM-MOM-22-0549-01B(R1), dated November 29, 2022.

(1) If the inspection was done on or after the effective date of this AD: Submit the report within 30 days after the inspection.

(2) If the inspection was done before the effective date of this AD: Submit the report within 30 days after the effective date of this AD.

(k) Parts Installation Limitation

As of the effective date of this AD, no person may install, on any airplane, any transfer pump motor impeller inlet adapter or inlet check valve (or assembly containing either) for the horizontal stabilizer fuel tank, unless the affected part has been inspected as specified in paragraph (h) or (i) of this AD, as applicable, and been determined to be a serviceable part as defined in paragraph (g)(1) or (2) of this AD.

(l) Credit for Previous Actions

This paragraph provides credit for actions required by paragraphs (h) and (i) of this AD, if those actions were performed before the effective date of this AD using Boeing Multiple Operator Message MOM-MOM-22-0549-01B, dated November 21, 2022.

(m) Special Flight Permit

Special flight permits may be issued in accordance with 14 CFR 21.197 and 21.199 to operate the airplane to a location where the actions required by this AD can be

performed, provided the horizontal stabilizer fuel tank is defueled and both transfer pump circuit breakers are locked in the “open” position.

(n) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (o)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(o) Related Information

(1) For more information about this AD, contact Samuel Dorsey, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone: 206-231-3415; email: Samuel.j.dorsey@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (p)(3) and (4) of this AD.

(p) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Multiple Operator Message MOM-MOM-22-0549-01B(R1), dated November 29, 2022.

(ii) [Reserved]

(3) For Boeing service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on December 21, 2022.

Christina Underwood, Acting Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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